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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,316	12/18/2001	Michael A. Tischler	ATMI-477	4967

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EXAMINER
LOUIE, WAI SING

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/022,316	Applicant(s) TISCHLER, MICHAEL A.	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19,42,44,45 and 47-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,42,44,45 and 47-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-68, drawn to semiconductor process tool, classified in class 257, subclass 684.

II. Claims 69-70, drawn to a method of processing a wafer, classified in class 438, subclass 464.

If group I is selected, further restriction is required to one of the following inventions under 35 U.S.C. 121:

III. Claims 1-19, 42, 44-45, and 47-50, drawn to a wafer carrier, classified in class 257, subclass 684.

IV. Claims 20-41, 43, 46, and 51-68, drawn to a process tool system, classified in class 257, subclass 731.

The inventions are distinct, each from the other because of the following reasons:

A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a

dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

A. Inventions Group I and Group II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, instead of carrying a wafer in the holder, it would be possible to carry a chip in the holder.

B. Inventions Group III and Group IV are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because Group III is the subcombination and Group IV is the combination. The subcombination has separate utility such as the carrier in Group III could be used to handle IC chips, substrates, and/or LED diodes while Group III is part of Group IV, which is a processing tool system.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with William Ryann on 11/14/02 a provisional election was made without traverse to prosecute the invention of Group III, claims 1-19, 42, 44-45, and 47-50. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-41, 43, 46, and 51-70 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 48 and 49 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claims 48 and 49, it is unclear what is meant by "said predetermined sized". For the purpose of examination, "said predetermined size of the recess" is assumed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-5, 10-12, 44-45, and 47 are rejected under 35 U.S.C. 102(e) as being anticipated by Chow et al. (US 6,187134).

With regard to claims 1-3, 5, and 11, Chow et al. disclose a semiconductor wafer carrier (col. 4, line 38 to col. 6, line 6 and fig. 3) enabling a wafer be processed in a process tool configured for processing a wafer (col. 5, lines 40-55 and fig. 10), where the wafer carrier included one recess (fig. 3a and 3b). Chow et al. disclose the predetermined shape is a cylindrical wafer (claim 4 and fig. 3) and could accommodate wafer of any size and shape (col. 2, lines 45-46).

With regard to claim 4, Chow et al. disclose the wafer in the recess having a close-fit relationship to the recess (fig. 6a).

With regard to claim 10, Chow et al. disclose the wafer carrier having a generally planar body (fig. 3b).

With regard to claim 12, Chow et al. disclose the recess has a flat floor (fig. 3b), where a correspondingly flat wafer can be reposed in the recess with a main bottom face of the wafer in contact over its facial area with the floor of the recess (col. 2, lines 19-24 and fig. 3b).

With regard to claims 44-45 and 47, Chow et al. disclose the wafer carrier has a pedestaled form and a columnar base (fig. 3b). The cylindrical recess of the wafer carrier has a first diameter and the columnar base 30 has a second diameter, where the second diameter is smaller than the first diameter (fig. 3b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-9, 18, 42, and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al. (US 6,187134).

With regard to claims 6-9, Chow et al. do not disclose the size of the wafer carrier. However, size is considered to involve routine optimization, which has been held to be within the level of ordinary skill in the art. As noted in In re Aller, the selection of reaction parameters such as size would have been obvious:

> "Normally, it is to be expected that a change in temperature, or in thickness, or in time, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general

conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any size suitable to the method in process in order to optimize the design.

With regard to claim 18, Chow et al. do not disclose the wafer carrier is formed of different material from that of the wafer. However, the material of construction is a matter of design choice and since the criticality has not been established. Therefore, it would have been obvious to choose a different material from the wafer to make the wafer carrier.

With regard to claim 42, Chow et al. disclose the tool comprises a single wafer-processing reactor, but do not disclose the reactor is an epitaxial reactor. However, it could be an epitaxial reactor.

With regard to claims 48 and 49, Chow et al. disclose the predetermined size of the recess of the wafer carrier can accommodate any size of wafer (col. 2, lines 45-46). Therefore, it can fit the wafer large or small.

With regard to claim 50, Chow et al. do not disclose the raised edge (outer edge) 26 has the same thickness of a wafer and has the same diameter as the wafer carrier. However, since the criticality of the thickness and diameter of the wafer and the carrier has not been established. The carrier could have the same thickness as the wafer and the same diameter as the wafer.

Claims 13-14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al. (US 6,187134) in view of Toya et al. (US 5,074,017).

With regard to claim 13, Chow et al. do not disclose a susceptor. However, Toya et al. disclose a susceptor, which could hold a plurality of wafers (Toya col. 2, lines 7-8 and fig. 1). Toya et al. teach the susceptor could process a plurality of wafers and can be precisely controlled in a uniform manner so as to increase yield. Therefore, it would have been obvious to one with ordinary skill in the art to modify Chow's device with the teaching of Toya to repose the wafer carriers into the recess of a susceptor in order to process a plurality of wafers in a uniform manner and increase yield.

With regard to claims 14-17 and 19, Chow et al. do not disclose the wafer carrier is formed of semiconductor wafer material. However, Toya et al. disclose the susceptor is made of silicon carbide and covered with quartz glass or fused silica plate, which is resistant to HCl etchant (Toya col. 2, lines 13-15, col. 2, lines 35-38, col. 3, lines 12-13 and fig. 1). Toya et al. teach if silicon semiconductor material is formed on top of the susceptor, it can be removed by etching (Toya col. 2, lines 35-38). Therefore, it would have been obvious to one with ordinary skill in the art to modified Chow's wafer carrier with Toya's teaching to make the wafer carrier from silicon carbide or quartz. Doing so would facilitate the cleaning of the wafer carrier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (703) 305-0474. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

wsl
November 17, 2002

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800